7-25-1 Bicycle & Pedestrian Facilities

January 1, 2000

1.1 Originator

This section has not yet been written.

1.2 Introduction

1.3 Process

1.4 References

J. Doe	1/7/2015
Author	Date

7-25-5 Curb Ramp Design

January 1, 2000

5.1 Originator

This section has not yet been written.

5.2 Introduction

5.3 Process

5.4 References

J. Doe	1/7/2015
Author	Date

7-25-10 Erosion Control Plans and Special Provisions

October 31, 2016

10.1 Originator

Technical Services

10.2 Introduction

The purpose of this section is to identify the key components of the erosion control plan and special provisions as required per Wisconsin State Statue Trans 401 and the DNR/DOT Cooperative Agreement and explained in FDM Chapter 10 *Erosion Control and Storm Water Quality*. The erosion control plans and special provisions will identify sensitive environmental areas, limit the risk of exposure to erosion, and select the best erosion protection options for projects.

10.3 Process

Before Completing a Plat

The purpose of developing an erosion control plan before completing the plat is to identify issues that may affect permanent drainage, grading issues, and ensure adequate right-of-way is available to install the proper erosion control devices.

Erosion Control Plan Design

Follow FDM 10-5 *Developing an Erosion Control Plan* for requirements. Include the following items in erosion control plan sheets:

- Follow FDM 10-10-1 *Devices and Measures Available* to illustrate the location of all erosion and sediment control devices, direction of ditch/channel flow, slope intercepts, and construction limits.
- Illustrate where water will leave the project.
- Identify drainage devices such as storm sewer inlets, culverts, bridges, and detention ponds.

- Erosion control bid items - Include bid items in estimate and legend of erosion control sheets. Utilize the erosion control matrices for slopes and channels during design. See FDM 10-5 Attachment 35.1 and Attachment 35.2 for matrices. Quantities are not required at DSR Review (formerly 60%) if not determined at this stage.
- Protection of waterways, wetlands, ditches, and sensitive areas.
- Break erosion control plan into stages to show temporary devices from permanent erosion control devices. If the project will be completed in multiple stages, consider adding plan stages to show each stage separately.

Erosion control items may be shown on plan sheets if adding erosion control to the plan sheet will not clutter the sheet. For spot locations such as guard rail terminals, erosion control may be shown on a construction detail or plan sheet.

Pre-PS&E Plans

Complete final plans by adding the final location of all erosion control bid items to the erosion control plans. Add final quantities and locations to the miscellaneous quantities. Ensure the bid items and construction details for erosion control are congruent with the special provisions for grading practices and timing restrictions.

Special Provisions

Follow FDM 19-15-60 when creating erosion control related special provisions. Write erosion control special provisions to specify desired results to protect sensitive areas and shorten timeframes to limit risk of erosion due to exposure. Address the following issues when applicable to your project:

- Grading practices: Staging, opening, and limiting work areas (finish one area of work before secondary area is opened). Leave the existing ground cover in place as much as possible.
- Scheduling and timing constraints - Oftentimes, the best method to reduce erosion is to decrease the time the work zone is under construction. Limit the work area that is open at one time, and/or tighten timeframes at highly sensitive areas.
- Landscaping - Require installation or completion of best management practices (BMP) within a specified timeframe. Examples include:
  - Install riprap within 5 days after storm sewer outfall or culvert installation.
  - Dress slopes within 5 days after majority of grading is completed in a specified area.
- Multiyear projects or late season construction - provide requirements to stabilize the project if final erosion control will not be established before the winter season.
- Dewatering
- Control runoff during rain events by diverting water not in contact with open soil, limit runoff by storing storm water to allow for settling sediment and treatment.
- Divert flows for structure work including diversion channels, building boxes half at a time, bypass pumping, or damming water.
- Include debris removal practices for bridge demolition projects. Include STSPs 203-010, 203-020 or 203-025 included in the STSP template.

The Region SPV Library is also a useful resource for referencing commonly-used erosion control related SPV's and specification modifications.

Bid Items

Consult FDM 10-10-1 *Devices and Measures Available* and the Table 10.1 below to determine which erosion control items are beneficial on projects. Consult the erosion control matrices to determine the appropriate bid items for slope and channel stabilization.

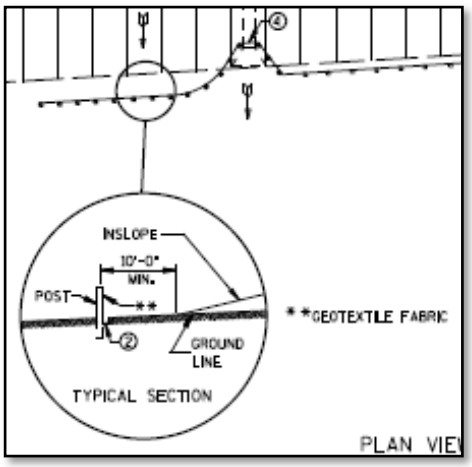
- FDM 10-5 Attachment 35.1 *Channel Erosion Control Matrix*
- FDM 10-5 Attachment 35.2 *Slope Erosion Control Matrix*

The Modified Erosion Control Matrix is a copy of FDM 10-5 Attachment 35.2 with bid item numbers and average unit price information from 2013-2015 added. This information has been included to provide designers a quick reference to compare erosion control options. For accurate cost information based on the size and location of your project, use estimating tools such as Estimator and Bid Express.

The following bid items should be included for grading jobs unless another resource is substituted.

Table 10.1 – Bid Items for Grading Jobs

Bid Item Number	Bid Item	Remarks
606.0100-606.0800	Riprap - various sizes	See FDM 13-30-25 *Rock Riprap Lined Channels* for design procedure to determine size. FDM 10-5 Attachment 35.1 *Channel Erosion Control Matrix* also addresses maximum slope length and grade for riprap types.
623.0200	Dust Control Surface Treatment	Example of use: When public traffic will be traveling on a gravel road.

624.0100	Water	Use for dust control, earthwork, and aggregate compaction. Water for compaction guidance is 10-20 gallon/ton of base aggregate per FDM 14-5-1.1. Use bid item Sod Water, Item 631.0300 for watering seed and sod.
625.0100-625.0500	Topsoil/Salvaged topsoil	Ensure adequate depth of topsoil is available if using salvaged topsoil. See Standard Spec 625.3.3 and FDM 10-10-11.3 for guidance. Four inches of topsoil is required in rural areas and six inches in urban areas. For sandy topsoil, consider replacing salvaged topsoil with topsoil to provide adequate growing material for seed.
627.0200-627.0205	Mulching	Cheapest ground covering option. Useful in temporary situations where the mulch can be incorporated into the soil for secondary stages. Mulch is hard to properly anchor and is not effective if not anchored to the soil. Consider using erosion mat when placed next to high-speed traffic.
628.1104	Erosion bales	Every project with grading should include erosion bales OR temporary ditch checks. Use temporary ditch checks unless there is a specific reason why erosion bales are preferred for the project. Follow Typical Installations of Erosion Bales/Temporary Ditch Checks SDD 8E8
628.1504	Silt Fence	Follow Silt Fence SDD 8E9. - Follow detail and extend silt fence across the top of pipes. - Follow detail to include a minimum of six to ten feet between silt fence and the toe of slope.  Do not place silt fence in channels or perpendicular to direction of flow. Release points - Ensure adequate release points in silt fence using the rule of thumb that no more than ¼ acre of disturbed area per 100 feet of silt fence per FDM 10-10-23.3. - Add temporary ditch checks, rock bags, erosion bales or stone ditch checks at silt fence relief points.
628.1520	Silt Fence Maintenance	Include on all projects with silt fence. FDM 10-10-23 recommends silt fence maintenance to occur at least every 30 days that silt fence is in

		place.
628.1550	Silt Screen	Only use if sediment cannot be kept out of the waterway and turbidity barrier is not an option for the project. Follow FDM 10-10-43 and SDD 8E12.
628.1905	Mobilization Erosion Control	See FDM 10-5-50.1 for quantity guidance.
628.1910	Mobilization Emergency Erosion Control	See FDM 10-5-50.1 for quantity guidance.
628.2002-628.2027	Erosion Mat - Class I, Urban, and Class II	Use the erosion control matrices to select the proper type of erosion mat. See FDM 10-10-15 for guidance and discussion of best application locations for mat.
628.2031-628.2039	Erosion Mat - Class III	Class III mats are turf reinforcement mats and are permanent mats which provide permanent stabilization to the grass roots. Class III B, C, and D mats are used in conjunction with soil stabilizer type A, class I, or class II mats which prevent erosion during the establishment of grass roots. Use the erosion control matrices to select the proper type of erosion mat. See FDM 10-10-15 for guidance.
628.5505	Polyethylene Sheeting	For retaining wall excavation.
628.6005	Turbidity Barrier	Only used when working in the waterway is required and sediment cannot be kept out of the waterway. Do not place turbidity barrier across stream. Follow FDM 10-10-45 and SDD 8E11 for guidance.
628.6505	Soil Stabilizer Type A	Type A stabilizer includes flocculent and mulch. Use the erosion control matrices to determine slope and slope length appropriate for type A stabilizer. Soil stabilizer type A is under bonded mulch on matrix.
628.6510	Soil Stabilizer Type B	Type B is flocculent without mulch. It is not effective in sandy soils. Can be used for as a standalone item for 3:1 or flatter slopes, earthen stockpiles, temporary, and late season applications. Use in conjunction with other bid items when slopes are steeper than 3:1.
628.7005-628.7020	Inlet Protection - Type A, B, C and D	Four types are specified in SDD 8E10 - Type A is utilized around field inlets and on pavement inlets prior to installation of curb and gutter. - Type B is utilized on streets without curb head after surrounding surfaces are in place. - Type C is utilized on streets with curb heads after surrounding surfaces are in place. - Type D is utilized in areas where other types of inlet protection are identified as incompatible with roadway and traffic conditions. Type D allows the inlet to pass more water than Type C inlet protection but requires frequent cleaning to be effective.
628.7504	Temporary Ditch Checks	Project should include temporary ditch checks unless erosion bales are desired for a specific reason. Follow FDM 10-10-22 and SDD 8E8 for guidance and typical spacing. Follow detail for vertical spacing of ditch checks. If temporary

<table>
<tr><td></td><td></td><td>ditch checks are used as a silt fence release, follow six-foot distance between toe of slope and ditch check location.</td></tr>
<tr><td>628.7555</td><td>Culvert pipe checks</td><td>See chart below for number of bags required per size of pipe.
<table>
<tr><th colspan="2">ESTIMATED BAG SIZE = 18" X 12" X 6"</th></tr>
<tr><th>PIPE SIZE</th><th>ESTIMATED NO. OF BAGS</th></tr>
<tr><td>12"</td><td>1</td></tr>
<tr><td>15"</td><td>2</td></tr>
<tr><td>18"</td><td>2</td></tr>
<tr><td>21"</td><td>3</td></tr>
<tr><td>14" X 23"</td><td>3</td></tr>
<tr><td>24"</td><td>3</td></tr>
<tr><td>27"</td><td>4</td></tr>
<tr><td>30"</td><td>5</td></tr>
<tr><td>19" X 30"</td><td>5</td></tr>
<tr><td>36"</td><td>7</td></tr>
<tr><td>24" X 38"</td><td>8</td></tr>
<tr><td>42"</td><td>8</td></tr>
<tr><td>29" X 45"</td><td>10</td></tr>
<tr><td>48"</td><td>10</td></tr>
<tr><td>34" X 53"</td><td>10</td></tr>
<tr><td>38" X 60"</td><td>13</td></tr>
<tr><td>60"</td><td>13</td></tr>
<tr><td>66"</td><td>15</td></tr>
<tr><td>53" X 83"</td><td>19</td></tr>
</table></td></tr>
<tr><td>628.7560</td><td>Tracking pads</td><td>See FDM 10-10-42 Tracking Pads for design guidance. It is important to have enough space for an adequate tracking pad. The minimum length is 50 feet long. Include tracking pads at all access points where earth work will occur. Add tracking pads for borrow and waste sites if sites are not commercial pits.</td></tr>
<tr><td>628.7560.S</td><td>Stone or Rock Ditch Checks</td><td>See FDM 10-10-25 Stone or Rock Ditch Checks for design guidance. See STSP 628-050 for contract language. Use this item with geotextile fabric type SAS if the ditch check is temporary and will be removed. Permanent stone ditch checks must be located outside of the clear zone or follow current roadway standards for roadside safety.</td></tr>
<tr><td>628.7570</td><td>Rock bags</td><td>Rock bags can be utilized as ditch checks, or as sediment traps at inlets per FDM 10-10-29.3.2.</td></tr>
<tr><td>628.0205-
628.0210</td><td>Fertilizer</td><td>Select the fertilizer type based off of the Fertilizer Type Region Map. Do not include fertilizer with native seed mixes. Do not place fertilizer within 20 feet of a water body or wetland.</td></tr>
<tr><td>629.1100</td><td>Agricultural Limestone Treatment</td><td>Generally, not needed in the SW region. Used to increase the pH of soil taken from wetlands or swampy conditions. When pH is low (below 5), DOT seed mixes will not grow well.
Further guidance can be found in CMM 6-40.1.1.
Application rate information FDM 10-10-12.3.1.</td></tr>
<tr><td>630.0100-
630.0199</td><td>Seeding (mixture)</td><td>Follow the Standard Spec 630 (Seeding) for guidance on appropriate mix types and application rates to use.</td></tr>
<tr><td>630.0200</td><td>Seeding Temporary</td><td>Use temporary seed to stabilize slopes or piles at interim stages of the project. Temporary seed should not be used with permanent seed as it slows the growth and establishment of the</td></tr>
</table>

		permanent seed. Mulch and fertilize area with temporary seed per FDM 10-10-6.3.1 Seed Rates: Seeding rate is 3 LB/1000 SF per Standard Spec 630.3.3.5.1(1) Dormant temporary seeding - 1.5 LB/1000 SF per CMM 6-40.3.1.9
630.0300	Seeding Borrow Pit	Add quantity to jobs with borrow or waste unless you are confident that the material will come from/go to a commercial pit. Seed borrow pits and stabilize using mulch or other erosion control items.
630.0400	Nurse Crop	Use with native seed mixes.
631.0300	Sod Water	Use to water sod and urban seeded areas. A special provision standard specification modification is available in the Region SPV Library for watering seeded areas.
631.1000-630.1200	Sod - lawn, and erosion control	Consider using seeding and erosion mat items. Review the construction schedule and plan to install sod early in the season for the best chance of successful establishment. Do not install on frozen ground. Sod is difficult to establish next to roadways that receive salt in winter.

Add an additional 25% of the total estimated quantity as undistributed per FDM 10-5-50, FDM 19-5-3.3.1, and FDM 10-5 Attachment 60.1. (Except for mobilization items and riprap items).

Consider extending the limits of seed, fertilizer, salvaged topsoil and mulch beyond the toe of slope to account for additional disturbances or storage of salvaged topsoil during construction. The typical section in Figure 10.1 below shows an example of extension beyond the work area. Place seed and fertilizer on the aggregate shoulder.

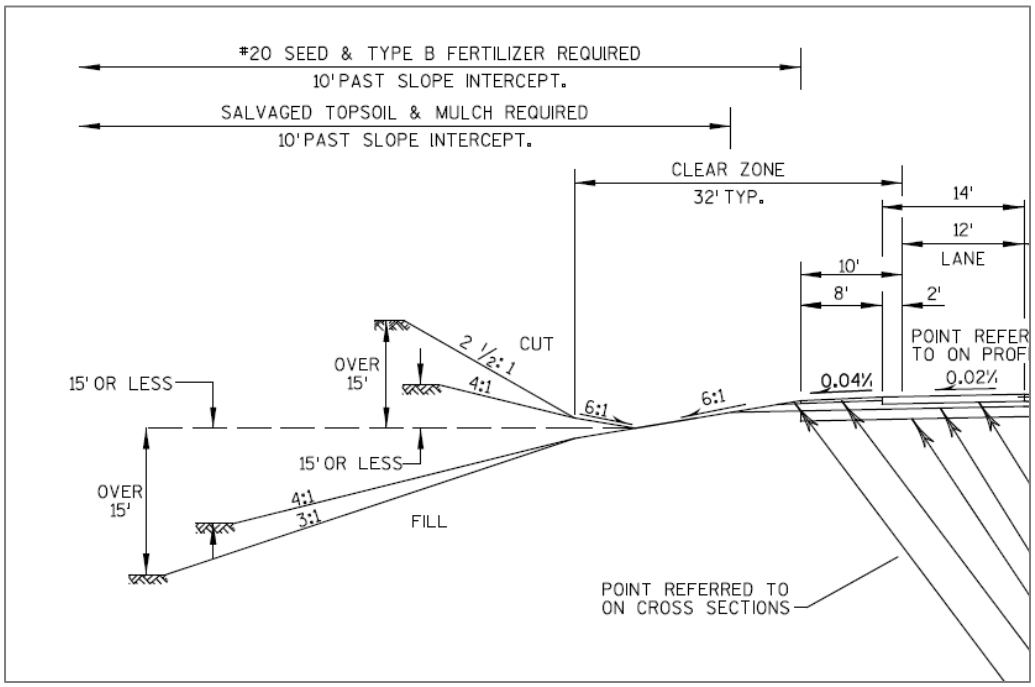


Figure 10.1 – Example of Extension Beyond the Work Area

Borrow and waste select sites - add erosion control quantities including borrow pit seed on projects that may utilize private select sites. Consider adding if commercial pits are not located close to the project or if land adjacent to our project may have suitable material for our project. See FDM 10-10-6.1.4. Include borrow pit seed and mulch or other erosion control items per FDM 10-10-6.3.4. Include all bid item quantities in the project estimate and miscellaneous quantity sheets.

Dormant seeding - Follow FDM 10-10-6.1.5 for seeding in late season. Consider including additional methods to control erosion over winter. Class I and Class II mats are biodegradable, and should not be installed after September 1st per the Wisconsin Erosion Control Product Acceptability List (PAL).

Construction Phase

See SWIG 8-15-1 for Erosion Control Implementation Plan Submittal Review.

See SWIG 8-15-5 for Release Reporting

See SWIG 8-15-10 for Erosion Control Inspections and Orders

10.4 References

FDM Chapter 10 *Erosion Control and Storm Water Quality*

FDM 10-5 Attachment 35.1 *Channel Erosion Control Matrix*

FDM 10-5 Attachment 35.2 *Slope Erosion Control Matrix*

FDM 19-15-60 *Erosion Control Special Provisions*

STSP template

Modified Erosion Control Matrix

Fertilizer Type Region Map

Wisconsin Erosion Control Product Acceptability List (PAL)

Regional Stormwater/Erosion Control Engineer (LAX) - Sam Kube, sam.kube@dot.wi.gov

Regional Stormwater/Erosion Control Engineer (MAD) - Peter Fillipi, peter.fillipi@dot.wi.gov

Christine Krall & Brad Schultz	*10/31/2016*
Author	Date

7-25-15 Drainage *date*

15.1 Originator

This section has not yet been written.

15.2 Introduction

15.3 Process

15.4 References

	Click here to enter a date.
Author	Date

7-25-20 Storm Sewer Design *January 1, 2000*

20.1 Originator

This section has not yet been written.

20.2 Introduction

20.3 Process

20.4 References

J. Doe	1/7/2015
Author	Date

7-25-25 Staging / Constructability / Coordination with Traffic Control *January 1, 2000*

25.1 Originator

This section has not yet been written.

25.2 Introduction

25.3 Process

25.4 References

J. Doe	1/7/2015
Author	Date

7-25-30 Outdoor Advertising Reviews and Removals *January 1, 2000*

30.1 Originator

This section has not yet been written.

30.2 Introduction

30.3 Process

30.4 References

J. Doe	1/7/2015
Author	Date

7-25-35 Salt Sheds *January 1, 2000*

35.1 Originator

This section has not yet been written.

35.2 Introduction

35.3 Process

35.4 References

J. Doe	1/7/2015
Author	Date

7-25-40 Urban Intersection Sight Distance and On-Street Parking Requirements *January 1, 2000*

40.1 Originator

This section has not yet been written.

40.2 Introduction

40.3 Process

40.4 References

J. Doe	1/7/2015
Author	Date

7-25-45 Detour Route Improvements/Maintenance Requirements *January 1, 2000*

45.1 Originator

This section has not yet been written.

45.2 Introduction

45.3 Process

45.4 References

J. Doe 1/7/2015
Author Date

7-25-50 Traffic Control, Alternate Entrance Ramp Configuration in High Volume Areas *December 13, 2017*

50.1 Originator

Project Development Section and Systems Planning & Operations - Operations Section

50.2 Introduction

This section provides guidance on how to determine the best option for an entrance ramp to enter into a work zone.

50.3 Process

In recent years, construction staff in the SW region have found that, in areas with higher volumes, the previous standard detail (SDD 15D15 “Traffic Control, Exit and Entrance Ramp with Lane Closure”), which provided for a yield condition at entrance ramp locations during construction, was not an adequate solution. There were several issues caused by the yield condition. The two most common problems were:

1. The ramp traffic not being able to merge into mainline traffic and therefore stopping on the ramp leading to congestion and accidents.
2. Mainline traffic decelerating and even stopping to allow the ramp traffic to merge leading to unexpected mainline queuing and accidents.

Another scenario that has created merging issues on projects has been in areas where there are no lanes closed but the lanes are shifted to either the median shoulder or outside shoulder. When the mainline is shifted, the ramp needs to be examined and potentially shifted to some temporary alignment in order to maintain proper merging geometrics. This may require temporary grading and asphalt paving to ensure the ramp has the correct merging taper. This needs to be investigated regardless of traffic volumes.

Due to the above issues, guidance has been developed to help designers come up with alternative entrance ramp configurations in areas with volumes that could create a problem for the standard yield control configuration. Table 50.1 below shows at what volumes the alternative configurations should begin to be considered.

Table 50.1 - Volume Thresholds for Parallel Entrance Ramp Condition

Number of Mainline lanes available	Combined peak hour volume between mainline and ramp (minimum volume range)*
1	1300 - 1700
2	2900 - 3400
3**	N/A

* Dependent on truck percentage and assuming 12' lanes. The other factor to look at when using these thresholds is the geometry of the interchange. Certain entrance ramp configurations, including loop ramps and ascending ramps (side road crossing under mainline), can make it more difficult for merging traffic to locate gaps and safely merge. In these areas, lower thresholds may need to be used to account for a more challenging merge situation.

** In areas that have 3 lanes of mainline traffic, a yield condition should not be considered. Also, in areas that have an existing auxiliary lane, a yield condition is strongly discouraged due to traffic being accustomed to a free flow condition.

There are several options to look at if it is determined that a yield control is not the best option due to the volumes exceeding the thresholds shown in Table 50.1. These options include:

- Off peak lane closures
  - Due to volumes being close to threshold levels at the beginning and end of off peak hours, the yield condition may not work for the entire off-peak time period. This may require the parallel configuration to be done with drums until volumes drop enough to use the yield condition.

- Off peak ramp closure and detour
- Parallel entrance ramp
- Auxiliary entrance ramp lane
- Ramp closure and detour

SDD 15D15 “Traffic Control, Ramps within Lane Closures” has been updated based on MUTCD Figure 6H-44 alternative to include a parallel ramp which increases the merge area. The new SDD 15D15 provides recommended dimensions and signing for temporary parallel entrance ramps within both right lane and left lane closures. These details may need to be adapted to fit a specific interchange or project area. This is especially important for the "SDD 15D15 sheet b: Traffic Control, Ramps within Lane Closures" where varying existing ramp dimensions are likely to require adjustments to temporary pavement widening. Also, consider if periods of off peak or full ramp closure will be required to complete mainline work in the area occupied by the ramp merge.

In an area that has an auxiliary lane, you may need some additional “Lane Ends” signing since traffic is accustomed to a free flow movement.

Consider the cost of the alternative options as well as user delay in those options. Work with the Region Traffic Section, specifically the Work Zone Engineer to determine what volumes exist at the interchange.

50.4 References

SDD 15D15 Traffic Control, Ramps within Lane Closure

MUTCD Figure 6H-44

Region Work Zone Engineer (LAX) - Joe Schneider, joseph.schneider@dot.wi.gov

Region Work Zone Engineer (MAD) - *currently vacant*

Joe Schneider	*3/18/2016*
Author	Date

7-25-55 Replacing Existing Land Parcel or Boundary Monuments *January 29, 2019*

55.1 Originator

Project Development Section, Technical Services Section - Real Estate, Survey, and Plats

55.2 Introduction

This section provides guidance on replacing existing land parcel or boundary monuments (property pins) that are disturbed or destroyed by construction operations located in permanent easements, temporary easements, or construction permit areas.

Note: Refer to FDM 9-5-1.5 (9a) for guidance on setting property monuments in areas that are acquired as new fee acquisition.

55.3 Process

Wisconsin Statute 236.32 requires monuments that have been disturbed or destroyed to be properly replaced.

During design, it is important that all monuments are accurately depicted on the transportation project plat (TPP). This requires an accurate and thorough search for monuments with the initial survey investigation. The design team should review the locations of the existing monuments to determine if they may be disturbed by the proposed construction operations.

Projects that contain land parcel or boundary monuments that will be disturbed during construction operations shall include the following special provision (SPV) bid items in the project plan set:

- Research and Locate Existing Land Parcel Monuments, Item SPV.0060.##
- Verify and Replace Existing Land Parcel Monuments, Item SPV.0060.##

In some cases, the final number of monuments that are disturbed may vary depending on the contractor’s means and methods used to construct the project.

The above SPV items describe the contractor requirements to properly research, locate, verify, and replace existing land parcel or boundary monuments. The contractor is required to submit to the engineer and the county surveyor a monument location map with a cover letter that summarizes the work completed. The cover letter shall be signed, stamped, and dated by a professional land surveyor. The construction engineer should provide the information to the SW Region Survey Coordinator for filing. The Land Parcel and Boundary Monument Example includes a cover letter and plan sheets of the monument location, which can be used as a reference when developing this documentation on other projects.

55.4 References

Wisconsin Statute 236.32

Wisconsin Administrative Code, Chapter A-E 7

FDM 9-5-1 Preservation of Survey Monuments
FDM 9-25-1 Perpetuation of Landmarks
CMM 7-85 Survey Monuments
Research and Locate Existing Land Parcel Monuments, Item SPV.0060.##
Verify and Replace Existing Land Parcel Monuments, Item SPV.0060.##
Land Parcel and Boundary Monument Example
Madison Office Survey Coordinator - *currently vacant*
La Crosse Office Plat Coordinator - Joerg Feldbinder, joerg.feldbinder@dot.wi.gov

Matt Dapp	*3/1/2017*
Author	Date